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AGRICULTURAL NEWS LETTER

VOL. 15 - NO. 4 JULY-AUGUST, 1947

This publication contains information regarding new developments of interest to agriculture based on laboratory and field investigations by the du Pont Company. It also contains published reports of investigators at agricultural experiment stations and other institutions as related to the Company's products and other subjects of agricultural interest.

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NEW REEL THAT HANDLES BOTH SINGLE-FILAMENT AND BRAIDED LINES EXPECTED TO INCREASE USE OF NYLON FISHING LINES

Many fishermen, long familiar with nylon filament in leaders, have experimented with and adopted this material in greater lengths as complete lines. This new usage is expected to increase sharply with the introduction of a reel that handles both single-filament and braided lines with equal facility.

Advantages of Single-Filament Line

Among the advantages of the single-filament line is the elimination of leaders and the resulting knots. This does away with water disturbance sometimes set up by the knots dragging through the water. Translucency and lack of sheen also contribute to effectiveness.

The new reel is a satisfactory spool "spinning" type so constructed that it doesn't turn on the cast. A simple thumb catch sets it for the retrieve. It can be used with either a fly rod or a baitcasting rod. It is completely enclosed, made of stainless steel with bronze bushing. The line guide and flyer are chrome plated.

Designed to handle three-pound to ten-pound lines, the reel has been found particularly successful with six-pound test Du Pont nylon single filament. The reel is made by Humphreys for the Haywood Manufacturing Company of Denver, Colorado, which produces the Zephyr nylon single-filament line.

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MICHIGAN TESTS SHOW 2,4-D, PROPERLY APPLIED, REDUCES POLLEN WITHOUT DESTROYING RAGWEED NEEDED TO PREVENT EROSION

Ragweed Pollen Causes Hay Fever

Many areas in Michigan are covered, during the summer and fall, with a heavy growth of ragweed which produces large amounts of pollen. This pollen is air-borne and causes hay fever in 5 to 10 per cent of the population, according to Dr. Buford H. Grigsby of the Michigan Agricultural Experiment Station.

Menaces Human Comfort and Health

"Thus ragweed is a menace to the comfort and health of a large number of people," he says. "However, the ragweed-infested areas usually are fallow lands, roadsides, and other uncultivated areas where a cover of vegetation is needed to prevent soil erosion.

"A program of weed control which reduces the pollen production in these areas, yet retains the soil-holding properties of the native vegetation, seems desirable.

"2,4-D can be used to develop such a program and at a reasonable cost."

Experiments in Michigan show that pollen production of ragweed can be reduced without complete destruction of the plants during summer and fall by proper treatment with 2,4-D weed killer.

Recent developments in chemical weed-control methods have caused garden clubs, resort associations, and various civic organizations to become interested in setting up a workable program of weed control, particularly of ragweed, according to Dr. Buford H. Grigsby, in Michigan Agricultural Experiment Station "Quarterly Bulletin," Vol. 28, No. 4.

"In many areas it is desirable to have ragweed rendered sterile, so far as pollen production is concerned, but not killed quickly," Dr. Grigsby says. "The plants have some value in preventing soil erosion, and also as a cover for otherwise bare and unattractive vacant land areas."

Ragweed Killed By Suitable Concentration of 2,4-D

In the Michigan experiments, ragweed was killed by a single application of 2,4-D at a concentration of 1,000 parts per million.

Continued on next page

Pollen production by old plants was stopped, without causing immediate death of the plants, by spraying with a concentration of 500 p.p.m. A more rapid response was obtained by the addition of very small amounts of either sodium chlorate or "Ammate" weed killer.

"Pollen formation can be prevented by spraying ragweed in the stage of growth just preceding flower-stalk elongation with 250 p.p.m. 2,4-D," Dr. Grigsby reports. "Plants sprayed in this stage appear to be arrested in development, and usually persist until frost. No pollen and few seeds are produced by such plants."

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UNUSED TREATED OATS, WHEAT, AND FLAX CAN BE PLANTED NEXT YEAR

Thousands of bushels of chemically treated oats, wheat, and flax that could not be planted throughout the Central West this Spring because of adverse weather need not be lost.

Du Pont plant pathologists advise that the disinfected seed can be carried over and planted next year, if properly handled and stored.

Treated Seed Should Not Be Fed to Poultry or Livestock

"Treated seed should not, under any circumstances, be fed to poultry or other livestock," they declare.

Growers have long used New Improved "Ceresan" seed disinfectant to control various smuts of wheat, oats, and barley as well as numerous soil-borne and seed-borne diseases and seed decay of other grains, flax, cotton, peas, and sugar beets.

Last year, Helminthosporium blight of oats appeared for the first time in this country on a widespread scale, causing particularly heavy losses to some of the newer varieties. Tests and field observations showed that oats treated with the ethyl mercury phosphate dust gave good control and produced much larger yields per acre.

Agricultural workers last fall launched an all-out campaign to convince farmers of the importance of seed treatment, regardless of variety of oats grown. Their efforts were so successful that most of the seed was treated for this year's planting. Many growers, unable to get their crops planted because of bad weather, have requested information regarding disposition of this treated seed. The Du Pont scientists urge farmers to consult their county agent or other local agricultural authority for specific recommendations on handling and storing their treated seed.

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NEW YORK TESTS SHOW ONE APPLICATION OF 2,4-D AT PROPER TIME PREVENTS POLLEN PRODUCTION IN RAGWEED IN COMMON AND GIANT SPECIES

"Ragweed pollen in late August and September is the chief cause of hay fever for several hundred thousands of New York citizens," according to F. G. Smith of the Agricultural Experiment Station at Geneva, N. Y.

Important Economic and Health Problem

"Control of pollen production is therefore an important economic and health problem. In many urban areas in the East and Middle West before the war, considerable effort and expense were put into campaigns to eradicate ragweed by cutting or treatment with various herbicides.

"The end of the war and the success of the new weed killer 2,4-D (2,4-dichlorophenoxy acetic acid) in preventing ragweed pollen production will greatly encourage community action in controlling this pest."

Farmers To Help Clean Up Own Property

Mr. Smith points out that farmers, especially in the vicinity of urban areas, may be called on to help by cleaning up their own property.

Countrywide trials with 2,4-D as a weed killer have proved its general advantages when used to control ragweed and to prevent ragweed pollen production, according to F. G. Smith, writing in "Farm Research," Vol. 12, No. 3, published by the New York and the Cornell University agricultural experiment stations at Geneva and Ithaca.

He says that 2,4-D is effective at low concentrations, is inexpensive and easy to apply, is non-irritating to the skin, non-corrosive, and non-toxic to animals, as well as relatively selective in its action.

He reports that two years' tests at the Geneva station showed that 2,4-D is "a very effective agent for preventing pollen production in both the common and giant species."

Continued on next page

Time of Application

"Treatments made at weekly intervals starting the last week in July showed that the latest safe date for treatment was at the stage before the pollen-bearing parts of the flower (involucres) had opened and had begun to ripen," he adds. "This occurred during the first week in August in 1945 in the vicinity of Geneva.

"Treatments at later dates even before pollen had matured did not completely prevent pollen shed later in the season."

2,4-D Should Be Used With Caution Near Crop Plants

"It is important to point out that, while 2,4-D is relatively inactive toward the grasses, it is active toward most broad-leaf plants," he adds. "Grapes and tomatoes, for example, are quite sensitive to the 2,4-D preparations used on weeds. Furthermore, weather conditions may markedly affect the response of many plants. Until more complete information is available on the selectivity of action of 2,4-D and the conditions affecting it, this material should be used with caution in the vicinity of crop plants."

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SHEEP SHOW NO ILL EFFECTS FROM CONTINUOUS INTAKE OF PHENOTHIAZINE

Many farmers now use phenothiazine in salt to keep their sheep free from internal parasites, a recent U.S. Department of Agriculture release says. It adds:

"Parasitologists who first worked out this free-choice plan at the Beltsville farm of the U.S. Department have had their flock on the plan longer than anybody else. After four years in a row, they report their sheep do very well in treating themselves to the medicated salt, and show no signs of ill effects from the drug."

U.S.D.A. Flock Fed Same As Recommended for Farmers' Sheep

The U. S. Department scientists follow the same prescription on their own flock they recommended to farmers in other parts of the country, one part phenothiazine to nine parts salt put out in the regular salting operation, where the sheep can get it any time they want it.

"During the fourth year of the experiment, their flock of 66 ewes had lower losses, produced more lambs, which weighed more at six weeks old than the lambs in any of the other three years of the experiment," the statement continues. "At shearing time, fleeces were heavier. And at lambing time, a parasite survey showed a very small parasitic infestation in the flock."

The government research workers concluded that since the sheep ate more of the phenothiazine than they actually needed to control the parasites, "they evidently have not acquired any dislike for the drug."

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SHORTAGE OF TURKEY RED OIL FOR USE IN SMEAR 62 LEADS U.S.D.A. TO ANNOUNCE NEW FORMULA (EQ SMEAR 82) FOR CONTROL OF SCREWWORMS

A variation in the formula generally used to make a suitable medical smear for treatment of screwworm-infested livestock has been developed by the U. S. Department of Agriculture at its Menard, Texas, laboratory.

The new formula, known as EQ Smear 82 although not superior to the original Smear 62, which was developed at the same laboratory, "is nevertheless a satisfactory substitute, and should be used if satisfactory materials are not available to make Smear 62," according to C. S. Rude and O. H. Graham, Division of Insects Affecting Man and Animals, at Menard.

These scientists point out that Smear 62 contains Turkey red oil, diphenylamine, benzol, and lampblack. Since Turkey red oil has been scarce in recent years and much of the available supply is off-grade, they developed EQ Smear 82, containing diphenylamine, 35 parts by weight, benzene (benzol) 32, "Triton" x-300 (sodium salt of an alkylated aryl polyether sulfate) 2, N-butyl alcohol 10, and lampblack 21.

They explain that the "Triton" x-300 formerly contained 20 per cent of active ingredient, whereas the present commercial product contains 30 per cent. They add that it will take some time to determine whether this change will affect the performance of the formula.

"However, the 30 per cent material may be diluted to 20 per cent by adding 1 volume of water to 2 volumes of the more concentrated product," they say.

Grades of Ingredients To Use

"The grade of lampblack used in this formula is that ordinarily sold by lumber yards and paint stores for tinting paints," Rude and Graham advise. "Lampblack appears to increase the killing action of the benzene and to impart a greater efficiency to diphenylamine for protecting the wound against infestation. The commercial grade of the other ingredients is used."

Proprietary products of Smear 62 have been on the market for some time. Veterinary medicine houses are now also marketing EQ Smear 82 products under their own trade names.

The government research workers at Menard have issued complete instructions for the making of Smear EQ 82 and for its application to infested wounds. Numerous precautions must be taken both in mixing materials and in their use on livestock. For full information write Mr. C. S. Rude at the Menard laboratory. Ask for Bulletin E-708 of the Bureau of Entomology and Plant Quarantine.

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U.S. GREW OVER MILLION AND HALF BUSHELS OF ALFALFA SEED IN 1946

Farmers in 22 states last year harvested more than a million acres of alfalfa for seed.

The total yield from 1,070,700 acres was 1,658,400 bushels of seed, compared with 1,182,100 bushel on 888,500 acres in 1945 and an average of 1,176,150 bushels annually on an average of 767,190 acres in the period 1935-44.

This is a national average yield of 1.55 bushels of seed per acre in 1946, 1.33 in 1945, and 1.57 per year for the 1935-44 period.

A tabulation issued by the U.S. Bureau of Agricultural Economics gives the following figures by states for 1946:

STATE	ACRES HARVESTED	ACRE YIELD Bu.	TOTAL PROD. Bu.
Ohio	6,500	.65	4,200
Indiana	8,200	.50	4,100
Michigan	50,000	.85	42,000
Wisconsin	24,000	1.10	26,000
Minnesota	48,000	1.20	58,000
Iowa	6,000	.70	4,200
N. Dakota	41,000	.85	35,000
S. Dakota	43,000	1.10	47,000
Nebraska	177,000	1.30	230,000
Kansas	258,000	1.50	387,000
Oklahoma	108,000	1.70	184,000
Texas	14,000	2.75	38,000
Montana	92,000	1.30	120,000
Idaho	23,000	1.50	34,000
Wyoming	16,000	1.35	22,000
Colorado	25,000	1.80	45,000
N. Mexico	12,000	2.80	34,000
Arizona	46,000	2.60	120,000
Utah	36,000	2.80	101,000
Washington	3,000	2.50	7,500
Oregon	7,000	2.20	15,400
California	27,000	3.70	100,000
UNITED STATES	1,070,700	1.55	1,658,400

THIS ALFALFA CROP "AIN'T HAY," SAYS OKLAHOMA EDITOR

As recently as 1938 alfalfa seed produced in Oklahoma was not regarded as adapted for planting in the North Central region.

"Today, Oklahoma seed enjoys a reputation as being some of the top alfalfa seed in the nation," according to Jack N. Ludrick, associate extension editor at the Oklahoma A. & M. College at Stillwater.

"It is because Oklahoma growers organized 16 county associations in 1938," he adds. "These grew 29,711 acres of approved alfalfa for seed. Today there are 32 county organizations with a total of 148,841 acres approved for alfalfa seed production in 1947. Oklahoma's 3,400 cooperating alfalfa growers realized over a quarter of a million dollars more than they would have without an alfalfa seed program last year."

The maximum price allowed for approved seed was four cents a pound higher than the ceiling price for Oklahoma's unapproved seed and the same as seed produced in the central region.

Mr. Ludrick says all approved seed is produced from parent stock that is drouth resistant, high yielding and of known hardy origin. It is free from Johnson grass, bindweed, dodder, and other noxious weed seeds.

States in the Ohio Valley region normally consume about two-thirds of the Oklahoma seed crop.

DDT CONTROLS INSECTS--INCREASES ALFALFA SEED YIELDS

Yields of seed were greatly increased when fields in Utah tests were dusted with DDT insecticide to control lygus bugs that attack alfalfa.

The treated alfalfa seed plots at the Utah Experiment Station at Logan produced approximately 400 pounds of seed per acre, while commercial fields dusted with DDT averaged from 200 to 300 pounds. Adjacent fields not dusted produced less than 100 pounds of seed per acre.

Acre Seed Yield Averaged 382 lbs. In 1925. Only 60 lbs. In 1945

The Utah Station's Bulletin 327, "Biennial Report for 1944-46," explains that in 1925 Utah produced about 26,000,000 pounds of alfalfa seed,

Continued on next page

while in 1944 the state produced only 16 per cent of the 1925 crop. The average yield per acre in 1925 was 382 pounds of seed; in 1945, 60 pounds.

Lygus Bugs Important Cause of Decline of Alfalfa Seed Yields

"Cooperative research work with the U.S. Department of Agriculture to find the cause or causes of these decreased alfalfa seed yields has shown the increase of lygus bugs in the field to be an important factor," the bulletin says.

DDT First Insecticide to Control Lygus Bugs of Alfalfa Economically

"Until DDT became available, no insecticide had been found that would control lygus bugs at a cost that was economically feasible," the bulletin continues. "During the past two years, tests with DDT have demonstrated that this insecticide offers promise of greatly increased production of seed through the control of lygus bugs."

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SPRAYING CATTLE WITH DDT MEANS MANY MILLIONS OF POUNDS MORE MEAT

Cattle growers obtained about 50 pounds of extra beef per animal for every five cents worth of DDT used to control horn flies, according to co-operators who conducted numerous spraying and dipping tests in Kansas during the past two summers.

Based on these estimates, the loss of beef in Kansas alone due to horn-fly injury amounts to more than 85,000,000 pounds annually, which would be worth approximately $8,500,000 to the grower when figured at 10 cents a pound, according to Dr. E. W. Laake, U.S.D.A. entomologist, who supervised the tests.

Importance of Spraying Entire Herd At Each Treatment

"When all animals in a herd were sprayed, the average duration of effectiveness increased with each treatment, but when only half were sprayed the duration was no greater after the third than after the second spraying," Dr. Laake reports. "Four dippings of 0.1 per cent DDT were effective for as long a time as the four sprayings with 0.2 per cent DDT, but dipping required about three times the amount of chemical."

Barns Free of House and Stable Flies for 2½ to 3 Months

Dr. Laake says that barns sprayed with a 5 per cent DDT emulsion to control house flies and stable flies were practically free of the pests for 73 to 98 days.

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MORE NITROGEN ON SUGAR BEETS MAY MEAN BETTER FLAVORED SOUP

Nitrogen fertilizer tests being conducted in sugar beet fields by the University of California may result in more and better soups.

Plant nutritionists have discovered that more nitrogen not only increases yields of beets but also produces more glutamic acid, a by-product of sugar refining used by soup manufacturers to bring out flavor in commercial soups, especially meat stocks.

Dr. Albert Ulrich, assistant soil chemist in plant nutrition at the California College of Agriculture, explains that glutamic acid is only about one-tenth of 1 per cent of the beet, compared with a sugar content of 10 to 20 per cent. In commercial production, the acid often appears in widely varying amounts after the refining process. Dr. Ulrich suggests that since losses during refining are relatively small, any differences are due to the beets.

Early Application of Nitrogen Increases Glutamic Acid

The California chemist reports that pot tests and detailed laboratory studies showed that the glutamic acid content of beets at harvest can be greatly increased by applying large amounts of nitrogen early in the season. Beet yields are also larger, and sugar concentration remains just as high with this fertilization, he says.

"A 10-acre field test confirmed the preliminary laboratory results," he adds. "Growers, sugar beet companies, and glutamic acid makers are cooperating in further research."

One of the cooperating companies made the glutamic acid analyses. The University planted the test plot and made leaf analyses of beets at different times during the season to determine how much nitrogen was being used.

Results of Studies Useful In Several Ways

"Results of these studies will be useful in several ways," Dr. Ulrich says. "Growers will know better how much nitrogen fertilizer to apply, growers and sugar beet companies may gain from higher yields and greater sugar production, more glutamic acid will be available for soups, and the University will obtain information on leaf analysis as a method of determining the fertilizer needs of sugar beets."

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SEED TREATMENT DESTROYS DISEASE-PRODUCING ORGANISMS ON SEED AND IN SOIL OR PREVENTS INFECTION OF PLANTS

"The diseases with which seed treatment is concerned are caused chiefly by fungi (molds) or bacteria (germs), which collectively can be described as pathogenic or disease-producing organisms," says Gilbert F. Miles, in charge of Du Pont's seed-treatment research work at Wilmington, Delaware.

Writing in "Agricultural Chemicals," for November, 1946, Mr. Miles says, in part:

"These organisms may be found for the most part on the surfaces of the seeds and in the soil. Their numbers are countless. For example, a single kernel of wheat infested with the spores (reproductive bodies) of the stinking smut fungus may carry as many as 500,000 spores, any one of which may fulfill its mission by infecting the young plant. An infected wheat plant usually produces nothing but worthless masses of smut spores instead of grain. To be effective, a seed treatment may be capable either of destroying all of those spores or preventing them from infecting the young wheat plant.

"This is, however, not all that is expected of a successful seed-treating chemical. In addition to the pathogenic organisms carried on the surface of the seeds, there are inconceivable numbers of harmful organisms in nearly all soils. Nature has equipped many of them with all sorts of tricky ways and means of surviving the winter's cold and reviving in the spring, ready to attack the planted crop seed. These soil-borne parasites are responsible, among other plant ailments, for the rotting of the seed, damping-off, seedling blights, and root rots, all of which add up to heavy losses for the farmer.

"The destruction by chemical seed treatment of organisms on the surface of the seed is usually described as seed disinfection or seed disinfestation, and the chemical used to destroy these seed-borne organisms is called a seed disinfectant or seed disinfestant. The prevention of attacks on the seeds and seedlings by soil-borne organisms is loosely referred to as seed protection, and the chemical agent as a seed protectant. Obviously, the ideal seed treatment combines high efficiency in both categories."

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A SEED DISINFECTANT AND PROTECTANT FOR EVERY MAJOR CROP

Certain seed-borne and soil-borne diseases that attack a particular crop are usually controlled by treating the seed with a formulation of some one chemical or combination of chemical compounds whose ability to do the job has been determined by extensive research.

Other diseases of other crops frequently require seed treatment with an entirely different chemical or chemicals, selected in competition with literally thousands of different compounds.

For instance, to control certain diseases of small grains, cotton, flax, peas, and sugar beets, plant pathologists recommend a commercial seed disinfectant containing a specified percentage of ethyl mercury phosphate. On the other hand, the chemical compound now generally recommended as excellent for control of a variety of diseases of corn, sorghums, peanuts, soybeans, and vegetables is tetramethyl thiuramdisulfide.

For that reason, the Du Pont Company makes several seed disinfectants and protectants that are marketed under different trade marks, each product containing the necessary active chemical ingredient or ingredients to cope with one or more diseases of some particular crop or crops. These include several different types of "Ceresan," "Arasan," "Semesan," and "Tersan" seed disinfectants and turf fungicides.

In the following discussion, the jaw-breaking names of the different chemical compounds contained in each material are given to indicate the differences and to explain why a variety of products is necessary to complete a full line of seed disinfectants and protectants for all major diseases and crops.

Two "Ceresan" Seed Disinfectant Products

The "Ceresan" seed disinfectants, of which there are two, are called New Improved "Ceresan," containing 5% ethyl mercury phosphate, and 2% "Ceresan," containing 2% ethyl mercury chloride. Both reduce or prevent seed decay and seedling damping-off, surface seed-borne angular leaf-spot, and anthracnose of cotton. The former is also used for wheat, oats, barley, rye, sorghums, millets, and flax to control certain smuts and some other seed-borne diseases. It also reduces seed decay and seedling damping-off of flax, peas, and sugar beets. The 2% "Ceresan" generally checks certain foot-rot diseases of peas and reduces basal-rot of narcissus.

Two "Arasan" Seed Disinfectant Materials

Tetramethyl thiuramdisulfide (50%) is available in "Arasan," used as a dust to reduce losses from seed decay and damping-off of corn, sorghums, peanuts, soybeans, and vegetables. As a disinfectant, it generally destroys

Continued on next page

many surface seed-borne organisms; and as a protectant, it generally protects seed against soil-borne organisms that cause seed decay. The other "Arasan" material, also supplying tetramethyl thiuramdisulfide (75%), is called "Arasan" SF. This comes in powder form for mixing with water to form a slurry. It is used to reduce seed decay and root-rot of corn. Research is underway on the use of the slurry method with this and other chemicals for other crops, including cotton and soybeans.

Four "Semesan" Fungicides

Three of the four "Semesan" fungicides have additional designations to indicate their special uses. The original product, called "Semesan" seed disinfectant, containing hydroxy-mercuri-chlorophenol, is used to treat vegetable seeds, flower seeds, and bulbs. It generally preserves seeds against rotting in cold, wet soils; it also controls damping-off or seedling blight and certain other seed-borne diseases. It helps promote germination, sturdier growth, larger yields, and better grade produce.

"Semesan" Bel, containing 12% hydroxy-mercuri-nitrophenol and 2% hydroxy-mercuri-chlorophenol, is mixed with water, and used as a dip for seed potatoes. On Irish potatoes, it reduces seed-borne Rhizoctonia and scab, and protects against seed decay. On sweet potatoes, it is used for treatment of seed and sprouts to control stem-rot, black-rot, and rust.

"Semesan" Jr. contains 1% ethyl mercury phosphate (note that New Improved "Ceresan" contains 5% of the same chemical compound). "Semesan" Jr. is a special seed disinfectant and protectant for field corn, pop corn, and sweet corn. Generally, this treatment helps protect seed against rotting in the soil, and checks forms of seedling blight and root-rot caused by certain fungi. It often improves germination, stands, and yields.

The fourth of this series is called Special "Semesan," a fungicide that contains 24% hydroxy-mercuri-chlorophenol, for application as a spray in water to lawns, golf courses, and other fine turfs especially to prevent or control large brown patch and dollar spot.

"Tersan" Turf Fungicide

The same turf diseases are also controlled or prevented by the non-mercurial "Tersan," which, like "Arasan", contain 50% tetramethyl thiuramdisulfide. "Tersan," while insoluble, can be suspended in water with a little agitation. It is popular for use as a spray on golf courses, grass tennis courts, lawns, and fine turfs. It is also used to control stem-rot and scurf of sweet potatoes and damping-off of onions, and for pelleting of onion seed to control smut.

NOTE: For complete information, write for reference manual entitled "Du Pont Semesan Seed Disinfectants and Turf Fungicides." Address Semesan Division, Du Pont Company, Wilmington 98, Delaware.

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FUMIGATION FOR CONTROL OF POULTRY DISEASES IN HATCHERIES

The modern hatchery has several rooms. An important one is the "clean" room where eggs from pullorum-free flocks, or those having a very low percentage of pullorum reactions, are hatched.

Since eggs that come through the usual channels of transportation are possible sources of infection, an egg-receiving room is beneficial in the control of disease.

Also of major importance is the provision for a separate room for the chick batteries. The doors should not open from the brooding room into the hatching room, for dust easily circulates between the two places. If possible, locate the chick room in a separate building from the hatchery. This arrangement is particularly effective for the control of bronchitis.

Maintenance of dry conditions, improved lighting including painting the walls a light color, and use of chemical disinfectants and fumigants are among sanitary measures that help hatcherymen control pullorum disease and a navel disease called omphalitis.

So says Glenn Searcy, a graduate of the Poultry Department of Purdue University, writing in the student publication, "The Purdue Agriculturist," Vol. 35, No. 5.

Mr. Searcy who is now poultry geneticist at the Ghostley's Poultry Farm, Anoka, Minn., says one infected chick or egg in the hatchery can infect a whole flock of chicks.

"Egg shells, bad eggs, dead-in-shell chicks, dirty trays, used chick boxes, and droppings are sources of infection, and must never be stored in the sales or the hatchery room," he says. "Walls painted a light color improve the appearance of the hatchery, as well as providing better light and more sanitary conditions."

Dust Particles and Down Carry Disease

"Dust particles and down are some of the most frequent carriers of disease," Mr. Searcy continues. "If the equipment in the hatchery is arranged in an orderly manner, a vacuum sweeper can be used to pick up the dust and dirt from the walls, floors, shelves, and other parts of the plant. Often the display shelves are forgotten when cleaning, but cleanliness there is almost as important as any other place."

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Incubator Should Be Fumigated Regularly

"Proper fumigation of the incubator can be an important step in the control of pullorum and omphalitis", the writer continues. "Even though no outbreaks of disease are evidenced, fumigation should be continued on a regular schedule".

Mr. Searcy discusses two methods of fumigation used in forced-draft machines. These are the formalin (formaldehyde solution 37% by weight) and potassium-permanganate method and the formalin-cheesecloth method.

"When fumigating eggs by either of these methods, the incubator temperature should be between 95 and 100 degrees F, and the wet-bulb reading above 85 degrees," he says. "For chicks the humidity reading should be between 90 and 93 degrees F."

Formalin and Potassium-Permanganate Method

"In fumigating either eggs or chicks, use 35 cc. of formalin and 17 to 20 grams of potassium permanganate for each 100 cubic feet of air space in the incubator, using outside measurements for calculations," he recommends. "Place the potassium-permanganate crystals in a pan and pour the formalin over them. The doors of the incubator should be left closed and the ventilators open. Eggs may be fumigated twice a week. When fumigating chicks, the wet-bulb reading should be raised to 90 to 93 degrees".

"Also," he says, "place the fumigant directly under the fans so that the gas becomes thoroughly mixed in the air channels before reaching the chicks. Some hatcherymen neutralize the formaldehyde gas after five to eight minutes of fumigation by using ammonium hydroxide.

"The humidity must be high, or disastrous results will be obtained when fumigating chicks. Do the first fumigation when 15 to 20 per cent of the chicks have hatched, and repeat every 12 to 15 hours until the hatch is off, provided the older chicks are removed at intervals. Never fumigate the same chicks twice or after they are 24 hours old."

Formalin-Cheesecloth Method

Mr. Searcy says the formalin-cheesecloth method calls for 20 cc. of formalin for every 100 cubic feet of incubator space, again using outside dimensions. Pieces of cheesecloth are dipped in the fumigant, and hung directly underneath the fans until they are dry. The same precautions should be taken in fumigating chicks as are used for the other method.

"The proper amount of formaldehyde liberated in the incubator is a satisfactory control for pullorum. Fumigating the eggs with two and one-half times the usual dose when transferring them to the trays is advisable if omphalitis is troublesome. Egg shells, down, and droppings should be removed between hatches with a vacuum cleaner. The trays should be scrubbed, and when dry they should be dipped into a tank of disinfectant."

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Agricultural News Letter (Du Pont)
Vol. 15, No. 4 July-August, 1947

SOUTHERN STATION FINDS "AMMATE" WEED KILLER EFFECTIVE ON BLACKJACK OAK

"Ammate" weed killer, the active ingredient of which is ammonium sulfamate, "is very effective in killing blackjack oaks," Fred A. Peevy, ecologist, Southern Forest Experiment Station, reports. "Ammonium sulfamate crystals are just as good as sodium arsenite for killing tree crowns, and sprouting from the base is less when ammonium sulfamate is used", he says. "Ammonium sulfamate is better in all respects than 2,4-D for killing blackjack oaks. It can be applied conveniently in a water solution as a spray for sprouts. It is not poisonous to livestock nor dangerous to handle."

"Ammate" is applied to trees in "cups" or holes in the main roots at the base of the trunk, close to the ground. A "cup" is made with two strokes of a sharp ax, one about two inches above the other, each slanting down and cutting into the trunk about one inch deep, and prying out the chip. On trees too small to be cupped, "Ammate" can be placed in holes at the base of the trunk. The holes are 0.5 inch in diameter and 1 inch deep. A special ax for this purpose has been developed by the Southern Station.

Treated trees or sprouts should be left standing several months for the chemical to take full effect.

How to Use "Ammate"

The following recommendations for use of "Ammate" to kill blackjack oaks have been issued by the Southern Station, following experiments with the chemical in central Louisiana;

1. Spray sprouts and small trees less than 1 inch in diameter with a 32.5 per cent water solution of "Ammate." This is made up from 4 lbs. of "Ammate" to 1 gallon of water. Fairly dense stands of sprouts 1 to 3 feet high can be sprayed at a cost of $15 to $20 per acre for material.

2. Small trees under 4 inches in diameter can be poisoned by applying 1 level tablespoon of "Ammate" crystals per cup in 2 small cups or holes made with an axe on opposite sides of the base of the tree.

3. Trees 4 to 8 inches thick can be treated for about two cents per tree for material, by injecting two level tablespoons of "Ammate" crystals per cup in cups or holes spaced 4 to 6 inches apart around the base. Larger trees require more cups and more "Ammate."

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LIVINGSTON DISCUSSES RESULTS OF SOME OF DU PONT RESEARCH BEFORE HYBRID CORN GROWERS IN CHICAGO AND FEED MERCHANTS IN NEW YORK

Corn growers in annual meeting in Chicago, June 21, were told that a newly developed and greatly improved method of applying a chemical disinfectant to seed corn is one of the outstanding examples of the fruits of chemical research.

"This new way of disinfecting seed corn against seed-borne and soil-borne diseases is called the slurry method," L. F. Livingston, manager of the Du Pont Company's Extension Division, said before the Hybrid Corn Section of the American Seed Trade Association. "It is the outcome of a broad research policy that encourages discovery of more satisfactory ways to use the products of industry, as well as discovery of better chemical formulations for specific uses."

New Method of Seed Corn Treatment Calls for Use of Slurry

Mr. Livingston explained that the slurry method calls for application of the chemical to the seed in the form of a suspension or slurry instead of as a dust or powder. The specially formulated chemical powder is added to water to form a slurry of the approximate consistency of buttermilk. This required the designing by Du Pont plant pathologists and engineers of a new type of seed treater to apply the slurry economically, safely, and efficiently.

"This slurry method came from Du Pont research aimed not only at production of a suitable chemical compound, but to eliminate bothersome flying dust during the treating operation, and to assure absolute accuracy and uniformity of the dosage applied to each individual grain," Mr. Livingston said.

New Process for Making Nylon from Corncobs and Other Farm By-Products

He cited another example of the findings of research of particular interest to corn growers. This is the recently announced chemical process to use such farm by-products as corncobs and cottonseed hulls in the making of nylon.

"These and other cellulosic materials are the sources of a new chemical known as furfural," Mr. Livingston explained. "The new process, which turns furfural into adiponitrile, a chemical important in making nylon, cost Du Pont about 12 years' time and approximately $1,000,000 spent on research. The furfural will be supplied to Du Pont by the Quaker Oats Company, which estimates it will require 200,000,000 pounds of corncobs or similar farm by-products annually to make the maximum amount of furfural needed for making the nylon intermediate."

Continued on next page

Discusses New Source of Vitamin D for Poultry

Ten years of research to develop a new source of vitamin D for poultry were successful just in time to help the industry meet the great demands of wartime with unprecedented production of chickens and eggs, Mr. Livingston told feed merchants in annual meeting in New York, June 9.

"The accomplishment is an outstanding example of industrial research," said Mr. Livingston, addressing the Eastern Federation of Feed Merchants.

Certain Chemical Compounds Called Sterols Converted Into Vitamin D

In 1927 it was found that certain chemical compounds known as sterols could be transformed by ultra-violet light into vitamin D. The new source of this essential vitamin came into full production, after more than ten years of research, just in time to serve -- and perhaps save -- the poultry industry during the war years, when egg and poultry quotas and production reached new all-time highs.

"Vitamin D helps rear chicks free from rickets, and is needed to maintain the health and productivity of breeding and laying stock, insuring satisfactory egg yields and desirable hatching quality in the eggs," he explained.

Mr. Livingston said Du Pont's "Delsterol" "D"-activated animal sterol, which supplies this so-called sunshine vitamin for poultry rations, is produced entirely from domestic raw materials for use by manufacturers of poultry feeds. He said that because of increased production and manufacturing economies, Du Pont recently was able to reduce the price of this source of vitamin D for the eighth time in seven years, the new price being a reduction of about 16 per cent. It is the second price reduction this year.

Urea Can Supply Portion of Protein In Ration of Ruminants

The discovery that synthetic urea -- also known chemically as carbamide - properly used, can efficiently replace a limited portion of the normal protein in the diet of dairy cows, growing heifers, steers, range cattle, and sheep, also was described.

"As a result of years of peacetime research, Du Pont was ready to help alleviate war-imposed protein shortages with a urea product known as 'Two-Sixty-Two' feed compound, designed especially to supply some of the protein in mixed feeds for ruminants," Mr. Livingston said. "This product has nitrogen equivalent to 262 per cent of crude protein; hence the name.

"The conversion of the urea into useful protein takes place in the animal's rumen. In non-ruminants, such as swine and poultry, it merely passes through unchanged and without harm to the animal, but with no nutritive value."

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MEAT INSPECTION DIVISION OF U. S. D. A. RULES THAT ANTU RODENTICIDE MAY BE USED IN MEAT-PACKING DEPARTMENTS THAT MAKE EDIBLE PRODUCTS

Wider public use of ANTU is predicted by the Du Pont Company as a result of two recent official government rulings.

ANTU is the popular name for Alpha-naphthyl-thio-urea, the new rodenticide developed by the Office of Scientific Research and Development during the war, with the cooperation of Du Pont.

The United States Department of Agriculture, Bureau of Animal Industry, Meat Inspection Division, now permits the use of ANTU rodenticides throughout meat-packing plants.

A recent circular, issued in Washington, said: "Extensive experimentation with ANTU in official establishments and elsewhere has shown this rodenticide to be an effective agent for killing the common gray-brown Norwegian rat . . . The Norway rat is usually the only variety of rat found in meat-packing plants, except for a few places in the southern part of the United States."

Commenting on this action, E. H. Rieman of the Grasselli Chemicals Department of the Du Pont Company said:

"We are gratified that this constructive action has been taken. The acceptance of ANTU by these high authorities stems from closely supervised tests employing Du Pont ANTU which were initiated more than a year ago. At the same time we would like to emphasize that while ANTU is not as dangerous as most rat poisons, it nevertheless is a poison and should be handled carefully."

Rule Regarding Shipment of Rodenticides By Parcel Post Modified

The Post Office Department, which heretofore has prohibited rodenticides from being sent through the mails, has recently modified its regulations in that regard.

Except for certain minor provisions, ANTU-based rodenticides may now be transported by parcel post. This is expected to facilitate the distribution of ANTU compositions in rural areas that cannot be economically reached by railway express or motor carriers.

NOTE: A full discussion of "How To Get Rid of Rats With Antu Rodenticides," in illustrated booklet form, is available upon request. Address Grasselli Chemicals Department, Du Pont Company, Wilmington 98, Del.

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